Forest Road Stabilization with a Tall-oil Emulsion

Issue: Low-volume forest roads are typically constructed with native materials using basic earthmoving machinery (excavators, bulldozers, and road graders). The resulting roads typically have low bearing capacity and develop ruts under traffic, particularly during wet weather. Aggregate is often applied to provide additional bearing capacity and as a wear surface. During use, frequent regrading is often necessary to maintain a usable road surface.

Study Description: Tall-oil is a by-product of the pulp and paper industry. A refined tall-oil product has been developed for use in roadbuilding as a soil amendment to increase cohesion and subgrade strength. This product is being evaluated for use on low-volume forest roads in central Alabama. An existing forest road was re-constructed using a soil stabilizer (Cat SS-250) to mix the chemical into the upper 8-10" of road surface. The road was then packed with a smooth roller. Four replications of four treatments have been installed: (1) no treatment, (2) mechanical without chemical, (3) 3:1 chemical mix, and (4) 6:1 chemical mix. Response variables being assessed include road bearing strength, subgrade moisture content, and hydraulic conductivity of treated material. In the Spring '00, the road will tested to failure using loaded trucks.

Status: The road treatments were installed in Fall 99. Post-construction CBR measurements were taken in November 99 and March 00. Controlled laboratory tests are being completed to assess soil type, chemical concentration, and moisture content effects on CBR and UCT. Samples collected in March 00 will be tested for hydraulic conductivity.

Benefits:

- *Reduced construction cost for forest roads (aggregate vs. chemical)*
- *reduced maintenance cost for forest roads*
- *reduced sediment generation from forest roads*
- *increased transportation capability during wet weather*

Cooperators: Woodlands Specialists; International Paper Co.; Arizona Chemical

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